

CERTIFICATE OF TRANSLATION

As a below named translator, I hereby declare that my residence and citizenship are as stated below next to my name and I hereby certify that I am conversant with both the English and Korean languages and the document enclosed herewith is a true English translation of the Priority Document with respect to the Korean patent application No. 1999-34013 filed on August 17, 1999.

NAME OF THE TRANSLATOR : Ji-Hoi KIM

SIGNATURE : _____

Date : January 8, 2004



**RESIDENCE : MIHWA BLDG., 110-2, MYONGRYUN-DONG 4-GA,
CHONGRO-GU, SEOUL 110-524, KOREA**

CITIZENSHIP : REPUBLIC OF KOREA

Translation of Priority Document

**THE KOREAN INTELLECTUAL
PROPERTY OFFICE**

This is to certify that annexed hereto is a true copy from the records of the Korean Intellectual property Office of the following application as filed

Application Number : Korean Patent Application No. 1999-34013

Date of Application : August 17, 1999

Applicant(s) : Samsung Electronics Co., Ltd.

July 26, 2000

COMMISSIONER

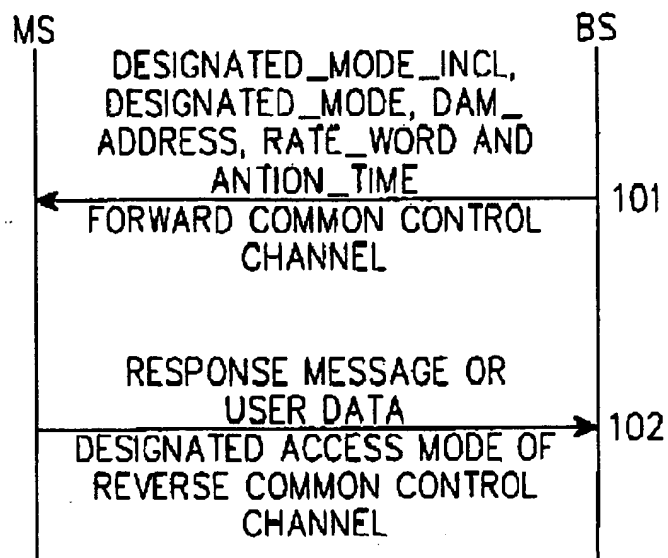
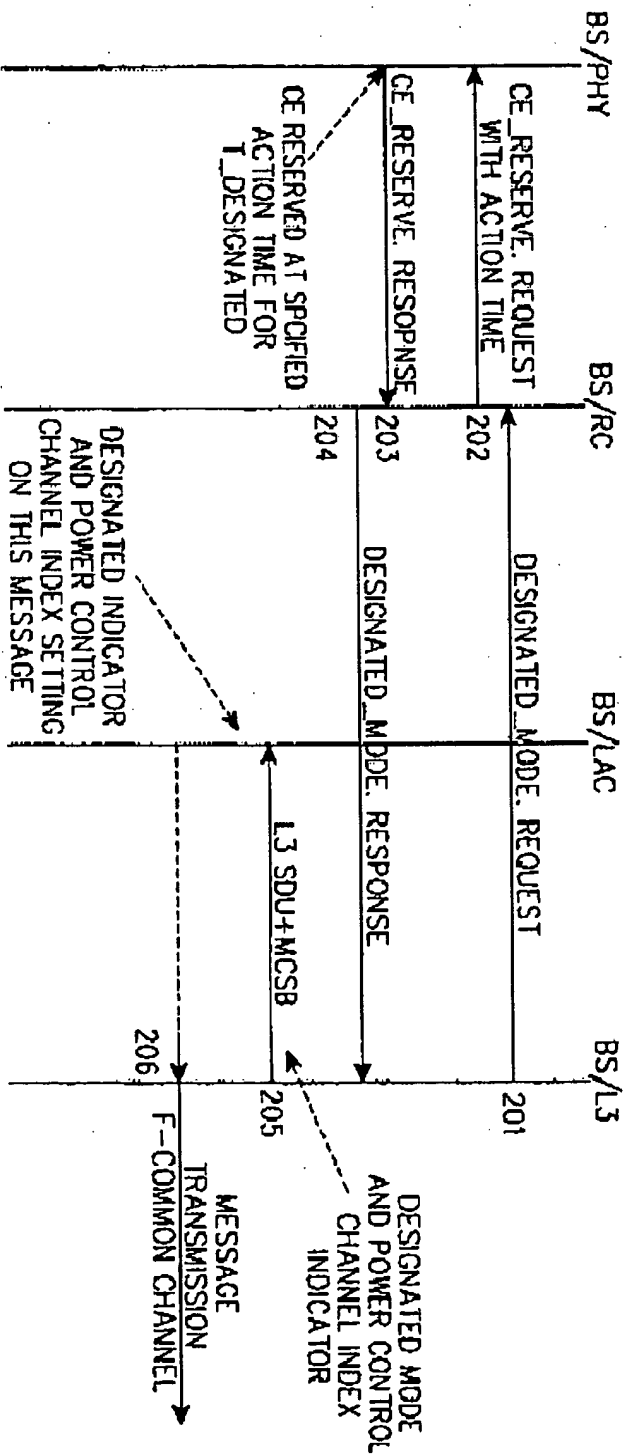


FIG. 1



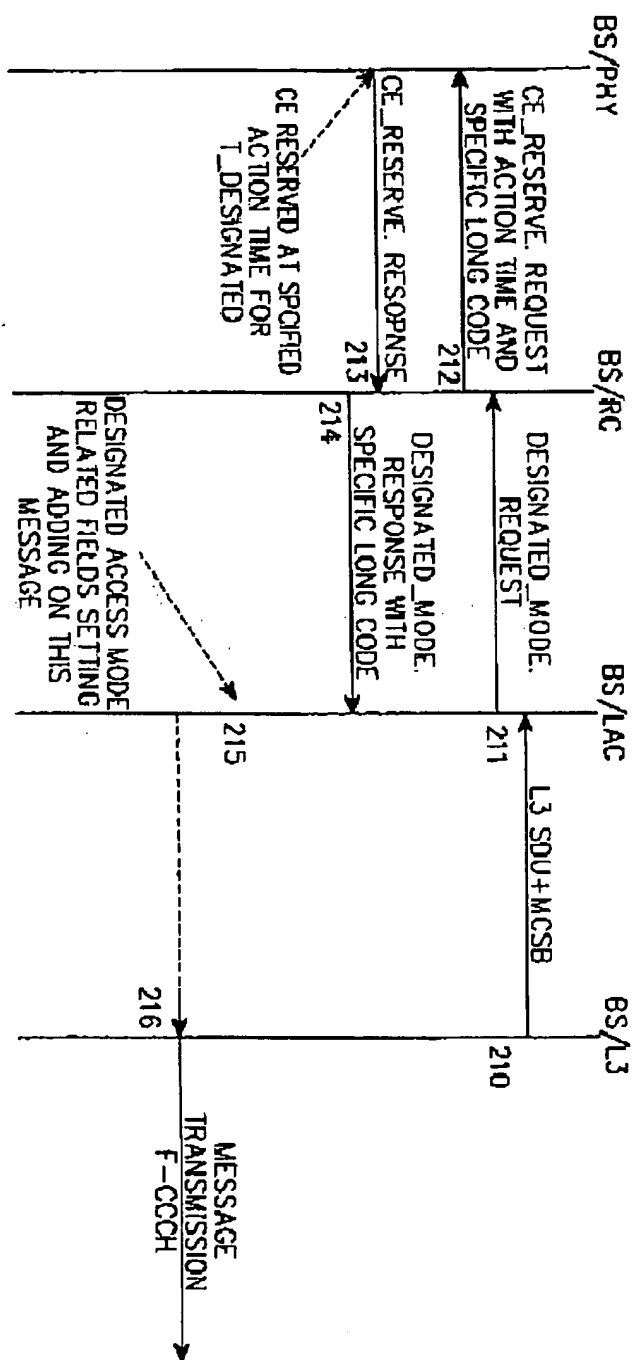


FIG. 2B

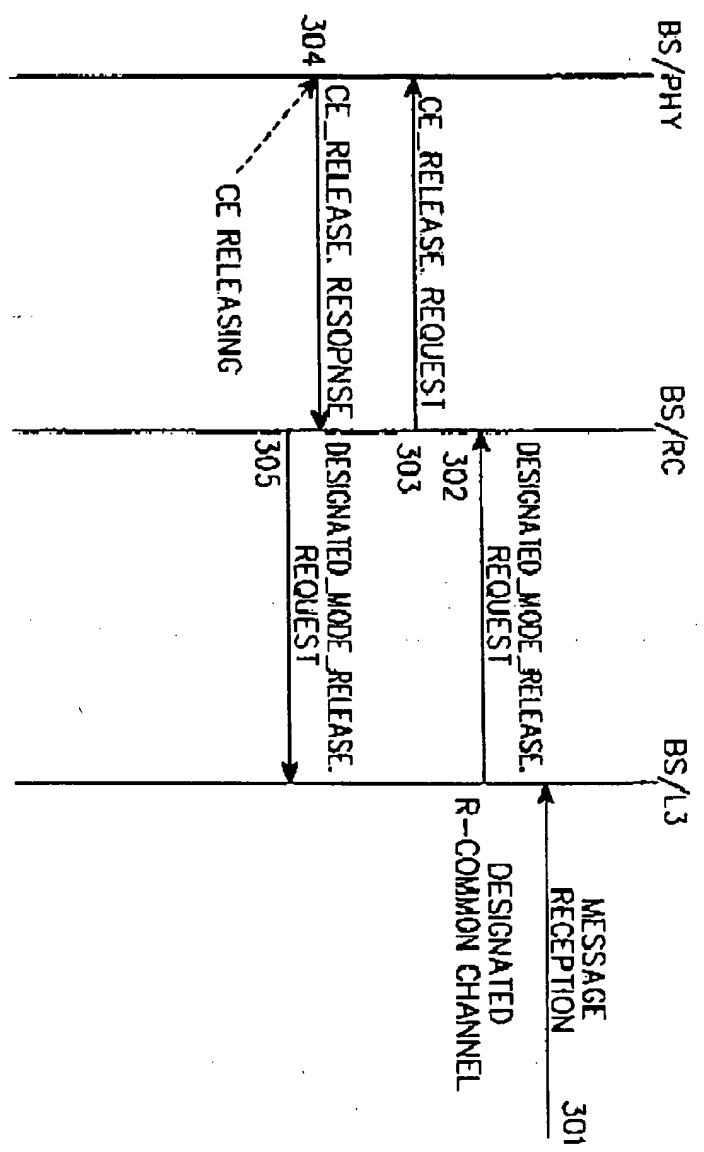
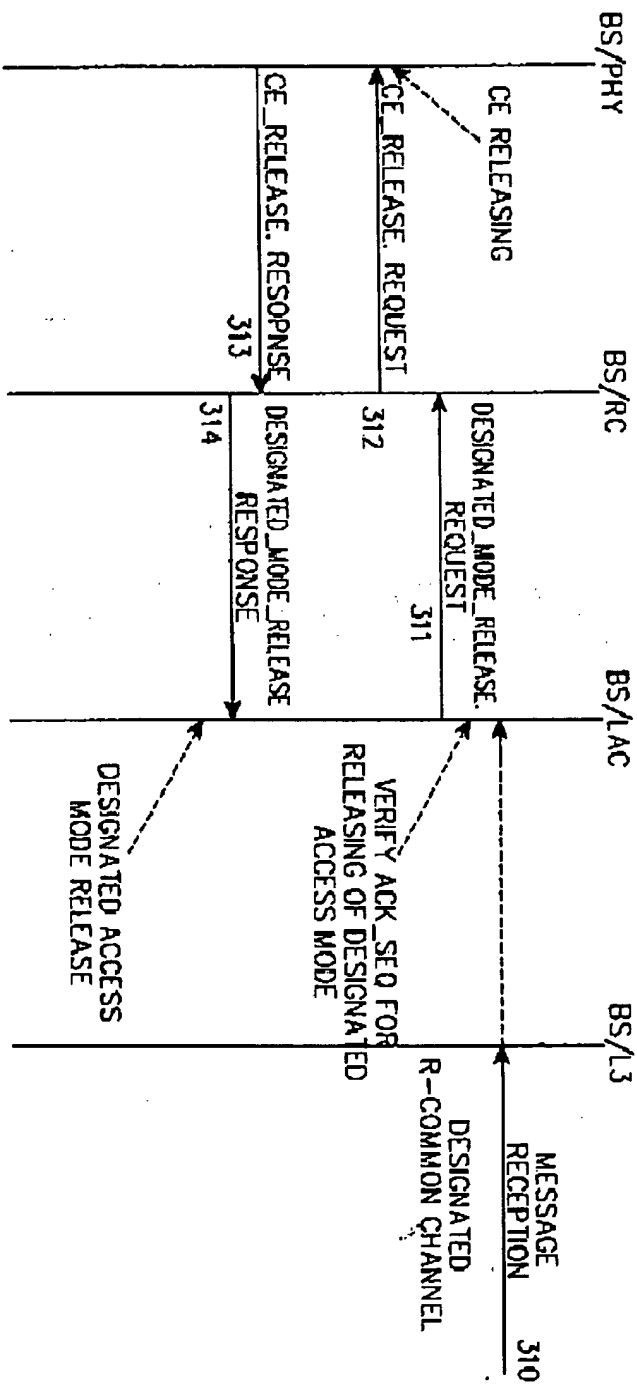


FIG. 3A



CC
C
C

[SPECIFICATION]

[TITLE OF THE INVENTION]

METHOD FOR DESIGNATING A REVERSE COMMON CHANNEL FOR
5 DEDICATED COMMUNICATION IN A MOBILE COMMUNICATION SYSTEM

[BRIEF DESCRIPTION OF THE DRAWINGS]

FIG. 1 is a signal flow in a basic procedure of designating a reverse common
10 channel to be dedicated according to the preferred embodiment of the present invention.

FIG. 2A illustrates a BS message transmission procedure for reverse common channel designation in a BS LAC layer in case a BS signaling layer requests release of a channel element (CE) from a reserved state according to another preferred
15 embodiment of the present invention.

FIG. 2B illustrates a BS message transmission procedure for reverse common channel designation in the BS LAC layer in case the BS LAC layer requests release of a channel element (CE) from a reserved state according to the second preferred embodiment of the present invention.

20 FIG. 3A illustrates a BS message reception procedure for reverse common channel designation in the BS LAC layer in case the signaling layer requests release of the CE from a reserved state according to the second preferred embodiment of the present invention.

FIG. 3B illustrates a BS message reception procedure for reverse common
25 channel designation in the BS LAC layer in case the BS LAC layer requests release of the CE from a reserved state according to the second preferred embodiment of the

present invention.

FIG. 4 illustrates an MS message transmission and reception procedure for reverse common channel designation according to the second preferred embodiment of the present invention.

5

[DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT]

[OBJECT OF THE INVENTION]

[RELATED FIELD AND PRIOR ART OF THE INVENTION]

10 The present invention relates generally to a common channel communication method in a Code Division Multiple Access (CDMA) communication system, and in particular, to a method for designating a common channel for dedicated communication with a specific mobile station.

15 Conventional CDMA mobile communication systems, which primarily provide voice service, have evolved into IMT-2000 standard systems. In addition to voice service, IMT-2000 systems can provide high quality voice service, moving picture service, and Internet browsing.

20 Data is communicated on dedicated channels and common channels in a mobile communication system. Dedicated channels and common channels are available on both the forward and reverse links. The common channels are so named because each common channel is commonly shared by a plurality of mobile stations (MSs). If more than one of the MSs attempt a call on a common channel at the same
25 time, contention occurs, impeding reliable communications. The contention problem of common channels is more serious on the reverse link than on the forward link.

On the other hand, no channel contention occurs on a dedicated channel because the dedicated channel is literally dedicated to one-to-one communication between a base station (BS) and an individual mobile station. Therefore, the message
5 transmission success rate is high on the dedicated channel. Due to the low transmission success rate on common channels, an MS will attempt to access a BS repeatedly on a common channel. Consequently, resources are misused and inter-channel interference increases.

10 In present CDMA mobile communication systems, especially the North America system, there is an R-CCCH (Reverse Common Control Channel) and an R-EACH (Reverse Enhanced Access Channel) for the reverse link, whereas, in a conventional IS-95B communication system, there is only an R-ACH (Reverse Access Channel) for the reverse link. When the MS has to transmit data on the R-ACH, it
15 competes with other MSs for the R-ACH and this competition or contention often leads to access failure.

As described above, in the competition-based reverse common channel communication method, when the MS has to transmit data on the R-ACH, it competes
20 with other MSs for the R-ACH and this competition or contention often leads to access failure. Therefore, various methods have been suggested through which a mobile station can promptly access a common channel when a base station communicates with the mobile station through the common channel in a CDMA mobile communication system.

25

[SUBSTANTIAL MATTER OF THE INVENTION]

It is, therefore, an object of the present invention to provide an apparatus and method for communicating between a BS and an MS on common channels with an increased transmission performance in a CDMA communication system.

5

It is also an object of the present invention to provide an apparatus and method for designating a common channel to be dedicated for one-to-one communication between a BS and a particular MS in a CDMA communication system.

10 It is another object of the present invention to provide an apparatus and method for designating a reverse common channel to be dedicated as a one-to-one communication link between a BS and an MS in a CDMA communication system, where the BS transmits a control message including spreading code information required for common channel designation and information about a common power
15 control channel to the MS, and the MS spreads user data with the designated spreading code according to the control message.

It is a further object of the present invention to provide a method for constructing messages in a BS LAC layer and interfacing between BS layers in order
20 to designate a reverse common channel to be dedicated for one-to-one communication between a BS and a particular MS in a CDMA communication system.

It is still another object of the present invention to provide a method for constructing a message in a BS LAC layer and interfacing between BS layers in order
25 to release a reverse common channel from a dedicated mode in a CDMA communication system.

It is yet another object of the present invention to provide a method for constructing a message in a MS LAC layer and interfacing between MS layers in order to designate a reverse common channel to be dedicated for a communication between a
5 BS and an MS and release the reverse common channel from the designated mode in a CDMA communication system.

To achieve the above and other objects, there is provided a method for designating a reverse common channel to be dedicated in a base station of a CDMA
10 (Code Division Multiple Access) communication system. The method comprising the steps of: transmitting, through a forward common channel, dedication information for designating the reverse common channel generated from an LAC (Link Access Control) layer as a dedicated channel, so as to dedicate the reverse common channel for one-to-one communication between the base station and a particular mobile station,
15 and designating the reverse common channel as a dedicated common channel; receiving through the designated reverse common channel a response message transmitted from the mobile station; and after receiving the response message, releasing the designated reverse common channel.

20 **[CONSTRUCTION AND OPERATION OF THE INVENTION]**

A preferred embodiment of the present invention will be described hereinbelow with reference to the accompanying drawings.

25 In present CDMA mobile communication systems, there is an R-CCCH (Reverse Common Control Channel) and an R-EACH (Reverse Enhanced Access

Channel) for the reverse link, whereas, in a conventional IS-95B communication system, there is only an R-ACH (Reverse Access Channel) for the reverse link. When the MS has to transmit data on the R-ACH, it competes with other MSs for the R-ACH and this competition or contention often leads to access failure. To increase the transmission performance of the reverse channel, methods have been suggested in which common channels are designated to be dedicated. Such methods are disclosed in Korean Application Nos. 1998-14179, 1998-13150, 1998-14274, 1998-14275, 1998-14276, and 1998-14880 filed by the applicant. According to common channel designation methods, when a BS and an MS attempt a call on a common channel, the MS designates a common channel for use in accessing the BS to be dedicated or quasi-dedicated to thereby be immune from the interference of common channel signals from other MSs and thus increase the transmission success rate.

The present invention is intended to provide an apparatus and method for designating a reverse common channel to be dedicated for one-to-one communication between a BS and an MS in a CDMA communication system, covering the structure of a message generated from a LAC (Link Access Control) layer of the BS, inter-layer interfacing, the structure of a message generated from the MS in response to a received message, and a communication method between the BS and the MS. Designation of a reverse common channel to be dedicated can be implemented in a signaling layer as well as in the LAC layer described in an embodiments of the present invention. When message fields are formed not by the LAC layer but by the signaling layer, the layers may be interfaced in a different manner.

The preferred embodiment of the present invention provides an apparatus and method for designating a reverse common channel to be dedicated and an inter-

protocol layer interfacing method. For this purpose, a BS transmits a control message on a forward common channel to an MS. This control message includes long code information representing the spreading code for common channel designation and common power control channel information. The MS responds to the control message
5 with a response message. In this case, the reverse common channel designation relieves the MS of the constraint of competing with other MSs for access to the common channel. In the embodiment of the present invention, reverse common channels include a reverse access channel (R-ACH), a reverse common control channel (R-CCCH), and a reverse enhanced access channel (R-EACH).

10

The reverse common channel designation ensures a rapid response time in transmitting a message on a designated reverse common channel, increases the transmission success rate of the reverse common channel, and reduces inter-channel interference caused by message re-transmission. Further, it decreases the number of
15 fields added by an MS LAC layer, thereby reducing errors that occur during message transmission.

Now, the preferred embodiment of the present invention will be described in detail with reference to the attached drawings.

20

FIG. 1 illustrates the signal flow between the BS and the MS in a common channel designating procedure for the case that the BS requests that the MS designate a common channel to be dedicated and the MS receives a message including parameters necessary for common channel designation from the BS, according to the preferred
25 embodiment of the present invention.

Referring to FIG. 1, the BS transmits dedication information (designated channel indicating parameters) to the MS on a forward common channel in step 101. The dedication information includes a designated channel including indicator (DESIGNATED_MODE_INCL), a designated channel indicator (DESIGNATED_MODE), the address of a common power control channel (DAM_ADDRESS: Designated Access Mode_ADDRESS), the data rate (Rate_Word), and the action time. Here, the action time may be added to a message or preset in a system. When the action time is added to a message for transmission, the message may be a common channel designating message or an access parameter message.

10 Therefore, when the BS is to designate a common channel to be dedicated for communication with a particular MS, it transmits a message with message fields including the above parameters constructed by a LAC layer to the MS on a forward common channel. Then, the MS analyses the message. If the MS confirms that the message includes the designated channel indicating parameters, it designates a reverse

15 common channel to be dedicated according to the parameters and transmits a response message to the BS on the designated reverse common channel in step 102. The response message may be a response for the received message or a user data traffic message. Since user traffic data is transmitted after common channel designation, the user data traffic message, if it is longer than a frame length supported by a physical

20 layer, is segmented prior to transmission. For designation of the reverse common channel, the MS may use its unique long code mask like an ESN (Electronic Serial Number) mask, a private long code mask, or a scheduled R-CCCH long code mask assigned to a specific MS by a BS through scheduling. When the schedule R-CCCH mask is used, the MS constructs the mask using the address of a common power

25 control channel that is referred to for designation of a reverse common channel.

A description will be made of a reverse common channel designating method in the LAC layer of the BS.

Table 1 lists exemplary messages transmitted from the BS to the MS on a forward common channel. Upon receipt of these messages, the MS should transmit response messages for the messages to the BS on a reverse common channel. In the preferred embodiment of the present invention, the BS includes the designated channel indicating parameters in the messages shown in Table 1 and the MS transmits corresponding response messages to the BS after designating the reverse common channel based on the designated channel indicating parameters, by way of example.

(Table 1)

Message Title on f-csch
Status Request Message
TMSI Assignment Message
General Page Message
SSD Update Message
Authentication Challenge Message
Base Station Challenge Confirmation Order
Extended Release Message
Service Redirection Message
Data Burst Message
Service Release Message
Order Message

Referring to Table 1, if the BS transmits a status request message to the MS on a forward common signaling channel (f-csch), the MS transmits a status response message to the BS on a reverse common signaling channel (r-csch). When the MS transmits the exemplary messages of Table 1 on a reverse common channel in the conventional mobile communication system, the messages may not reach the BS reliably and thus need to be retransmitted. The retransmission may incur interference with other MSs. However, transmission performance can be increased by designating the reverse common channel to be dedicated and transmitting the messages on the designated reverse common channel according to the preferred embodiment of the present invention.

To designate the reverse common channel, the LAC or MAC layer adds designated channel indicating parameters shown in Table 2 to the forward channel messages of Table 1, according to the preferred embodiment of the present invention.

15

(Table 2)

L3 SDU in Table 1	L3 SDU length [in bits] in Table 1
DESIGNATED_MODE_INCL	1
DESIGNATED_MODE	0 or 1
DAM_ADDRESS	0 or 6
RATE_WORD	0 or 3

Though not shown in Table 2, the action time is added to the messages shown in Table 1 or preset in the system. If the action time is added to a message, a BS signaling layer or LAC layer adds it. On the other hand, if the system presets the action time, the system estimates time when a message is transmitted from an MS,

20

considering time required for transmission of a message on a common channel to an MS, that is, propagation time delay and message processing time. The action time may be added to a common channel designation request message or an access parameter message. If the action time is added to the access parameter message, the MS receives
5 it when it access the system and stores it. When the MS receives a common channel designation command, it transmits a message to the BS based on the stored action time.

The designated channel indicating parameter fields include the four parameters
10 (or action time in addition) shown in Table 2. In Table 2, DESIGNATED_MODE is a field that orders the MS to designate a common channel to be dedicated, the field DAM_ADDRESS represents the address of a common power control channel, i.e., the index of the common power control channel that is referred to for control of the transmission power of a message to be transmitted after common channel designation,
15 and the field RATE_WORD indicates the transmission rate of a designated reverse common channel. The LAC layer adds a field Action_Time to notify the MS of the time to transmit a response message after the MS receives an exemplary message as shown in Table 1. The BS adds the two fields when it transmits a particular message or requests the MS to transmit a response message on the designated common channel.

20

For designation of the common channel to be dedicated, the corresponding MS should use a predetermined long code in spreading the reverse common channel and the BS should reserve a channel element to receive the reverse channel signal spread with the spreading code.

25

FIG. 2a is the signal flow in a procedure for adding information about the

reverse common channel designation in the BS LAC layer, according to the preferred embodiment of the present invention.

Referring to FIG. 2a, an LAC layer (L2) of the BS requests reservation of a
5 channel element before designation of the common channel in step 201, as stated
above. The designated mode can be set to designate the reverse common channel even
when the BS is to transmit a message that acknowledges designation among response-
requiring messages. Here, the f-csch messages listed in Table 1 require response
messages from the MS. When a response message should be received on a designated
10 reverse common channel, the BS L2 layer outputs a mode signal (Designated_Mode)
requesting reservation of channel resources.

Upon receipt of the channel element reservation request from the BS L2, the
resource controller (RC) of the BS transmits a channel element reservation request
15 signal including reservation action time (CE_Reserve. Request with Action Time) to
the physical layer (PHY) of the BS. The action time may be added to a message
directed to the MS or preset in the system. Action Time is set to an appropriate value
considering the time until the BS receives a response message from the MS after the
MS receives a forward common channel message from the BS. Action Time is added
20 in a LAC or signaling layer of the BS. The LAC layer adds one bit for USE_TIME
and 6 bits for ACTION_TIME to set Action Time. The duration (T_designated) of the
channel element reserved state is also set to prevent continuous occupation of the
channel element and misuse of resources in case the BS fails to receive the response
message within a predetermined time. The reservation duration can be set in
25 consideration of time required for transmission of the forward common channel
message, time required to process the forward common channel message in the MS,

and time taken for other related operations.

The reservation duration, set in step 203 of FIG. 2a, is necessary in case that the MS does not recognize the forward common channel message transmitted from the BS and thus cannot transmit a response message to the BS. Thus, the channel element starts to operate at the action time and the channel reserved state lasts for a time period set in a reservation timer (T_designated). Unless the BS fails to receive a required response message until the reservation timer expires, it automatically releases the channel element from the reserved state in order to prevent the dissipation of resources caused by the continuous reservation of the channel element. Thus, the timer should be set to an appropriate value.

In step 203, the PHY notifies the RC of information about channel element reservation. If it is not possible to reserve the channel element, the PHY generates a signal indicating "reservation unavailable" and the timer value is not set. If the channel element has been reserved, the PHY generates a reservation complete signal.

In step 204, the RC transmits a response received from the PHY to the L3.

If the L3 receives a signal indicating "reservation unavailable", it transmits common channel designation request information to the L2 through a message control status block (MCSB) to receive a response message for a transmission message or user traffic data from the MS. Upon receipt of the MCSB with an L3 SDU from the L3, it recognizes the processing method of the current received message and adds the following fields to a message for designation of a common channel.

The L2 sets DESIGNATED_MODE to 1 and writes the address of a common power control channel for reference in the MS and the data rate of a designated channel in the fields DAM_ADDRESS and RATE_WORD, respectively. If the L2 adds the action time to the message, it sets USE_TIME and ACTION_TIME. The
 5 action can be added by the L3.

If there is no common channel designation indication in the MCSB, the L2 sets DESIGNATED_MODE to 0 and omits the fields DAM_ADDRESS and RATE_WORD. Either the L2 or the L3 does not add USE_TIME and
 10 ACTION_TIME. This implies that the reverse common channel has the same characteristics as a conventional reverse common channel.

The thus-constituted message is transmitted to the MS on a forward common channel in step 205. Setting DESIGNATED_MODE to 1 in the transmission message
 15 implies that the MS should spread the reverse common channel with a particular long code. The long code may be a code unique to the MS.

FIG. 2B illustrates a BS operation similar to that shown in FIG. 2A, except that the L2 reserves the CE. Referring to FIG. 8B, the L3 transmits an MCSB
 20 including a command requesting setting of ACK_REQ along with an SDU to the L2 in step 210. If the received MCSB includes the command requesting setting of ACK_REQ, the L2 transmits Designated_Mode. Request to the RC, commanding reservation of the CE in step 211. In step 212, the RC checks the MAC state of the MS and transmits CE_Reserve. Request to the PHY. If the BS knows the ESN of the MS
 25 (e.g., in a suspended state), it designates an ESN-based long code mask. Otherwise, it designates a schedule R-CCCH long code mask. In addition, the BS sets an action

time for synchronization to a message transmission time of the MS. The action time can be set using the previous action time value transmitted through a common channel designation request message or an (enhanced) access parameter message. In step 213, the PHY notifies the RC of information about CE reservation. In step 214, the RC
5 transmits information about whether common channel designation is successful or not to the L2. In the case of successful common channel designation, the RC informs the LS of a designated long code mask type. The L2 sets common channel designated-related fields and adds them to a transmission message in step 206 and transmits the message on an F-CCCH I step 207.

10

FIG. 3A illustrates a BS operation when the BS receives the response message for the transmitted forward common channel message or user data traffic from the MS on the designated reverse common channel according to the second preferred embodiment of the present invention.

15

Referring to FIG. 3A, the BS receives the response message from the MS on the designated reverse common channel in step 301. If the reverse common channel has not been designated, the BS has, in effect, received the message on a conventional access channel.

20

In step 302, the L3 notifies the RC that the designated duration of the reverse common channel expires, when the L3 receives the user traffic data or the response message for the transmitted message that requires a response.

25

In step 303, the RC notifies the PHY that the reverse common channel should be released from the designated mode. Then, the PHY demodulates the designated

reverse common channel spread with a unique MS long code, (e.g., an ESN) and releases the reservation of the channel element.

In step 304, the PHY notifies the RC that the reservation of the channel element has been released. Then, the RC notifies the L3 of the release of the channel element from the reserved state, thereby wholly releasing the reverse common channel from the designated mode, in step 405.

FIG. 3B illustrates a procedure of releasing the reverse common channel from a designated mode in the BS LAC layer, unlike the procedure shown in FIG. 3A. In step 310, a message is received on a designated R-CCCH. The L2 processes ACK_REQ of the received message, determines whether the message is a response for a message requiring DAM, and transmits a DAM release request to the RC if the message is the response message in step 311. The RC requests release of the CE in step 312. The PHY releases the CE from the reserved state and notifies the RC of the result in step 313. The RC notifies the L2 that DAM has been released in step 314.

As described above, for a communication between a BS and a specific MS on a designated reverse common channel, a channel element is reserved and the reservation duration of the channel element is set. If the reserved channel element is available, the BS transmits dedication information (designated channel indicating parameters) to the MS on a forward common channel at a designated action time. The dedication information is added to one of the forward common channel messages shown in Table 1 that require response messages on a reverse common channel and includes the designated channel indicating parameters of DESIGNATED_MODE_INCL, DESIGNATED_MODE, DAM_ADDRESS, and

RATE_WORD as shown in Table 2.

DESIGNATED_MODE_INCL may be one bit. If this field is set, a spreading code that designates the reverse common channel is generated. Here, the BS and the MS control a preset dedicated long code to be generated for the reverse common channel. The spreading code can be a long code mask generated using the ESN mask of the MS, a public long code mask, or a predetermined long code for common channel designation.

If the DESIGNATED_MODE_INCL is set to 0, then the DAM_ADDRESS and the RATE_WORD are also removed. If the DESIGNATED_MODE_INCL is set to 1, then the DAM_ADDRESS and the RATE_WORD are properly set. When a long code mask is generated using an ESN, the DAM_ADDRESS represents the address of a power control channel to which an MS refers. When a long code mask is generated using a scheduled R-CCCH, the DAM_ADDRESS is used as one factor for both address of a power control channel and a long code mask.

Table 3 shown below lists message fields added by a LAC layer of the MS when the MS transmits the response message on the designated reverse common channel.

(Table 3)

Field	Basic Mode	Designated Mode	Length [bit]
MSG_TYPE	M	M	8
ACK_SEQ	M	M	3
MSG_SEQ	M	M	3

ACK_REQ	M	M	1
VALID_ACK	M	M	1
ACK_TYPE	M	M	3
MSID_TYPE	M	O	3
MSID_LEN	M	O	4
MSID	M	O	$8 \times \text{MSID_LEN}$

(M: Mandatory, O: Optional)

where message fields labeled with M are always included in a message and message fields labeled with O can be omitted when a reverse common channel is designated.

5 In Table 3, the LAC layer adds the fields listed under Basic Mode when the MS is to transmit the response message on the reverse common channel. Because the common channel is commonly shared by a plurality of MSs, the MS should transmit its address to the BS so that the BS can identify the MS. Therefore, MSID_TYPE, MSID_LEN, and MSID are of necessity added. However, if the reverse common
10 channel is designated to be dedicated to the specific MS, the fields MSID_TYPE, MSID_LEN, and MSID that identify the MS are not necessary, as shown in the list under the Designated Mode column in Table 3. The resulting decrease in the number of fields added by the LAC layer reduces transmission errors.

15 MSG_TYPE provides transmission characteristics of the message. ACK_SEQ is the sequence number of the response. The BS confirms message receipt by checking the stored sequence of its transmitted message and the sequence of a received message. MSG_SEQ indicates the sequence of a transmitted message. ACK_REQ is a command requesting a response for the current message. If this field is set to 1, the BS
20 or the MS that receives the message should transmit a response message. VALID_ACK indicates the validity of an acknowledgment and ACK_TYPE indicates

termination of the acknowledgment.

As noted from Table 3, designation of a reverse common channel increases a transmission success rate and reduces inter-channel interference. Furthermore, the length of an MS-initiated message is decreased, thereby reducing message transmission errors.

FIG. 4 illustrates a procedure of processing a message including reverse common channel designation request information from the BS and transmitting a response message for the received message to the BS in the MS.

Referring to FIG. 4, the MS receives a message from the BS on the forward common channel in step 401.

The L2 of the MS recognizes that the received message has a reverse common channel designation request field and places a designated mode indicator requesting transmission of the response message on the designated reverse common channel in a OCSB (PDU Control Status Block) along with an L3 SDU free of the LAC layer-related fields of the received message to the L3 in step 402.

20

The L3 transmits the L3 SDU and the MCSB including information requesting transmission of the response message on the designated reverse common channel to the L2 in step 403.

The L2 recognizes that the current received message is to be transmitted on the designated reverse common channel from an analysis of the MCSB received with the

L3 SDU, does not add MS ID-related fields as shown in Table 3, and transmits an L2 PDU and PCSB to the MAC layer of the MS in step 404. Here, the MS ID-related fields are excluded in the L2 PDU and a designated mode indicator is placed in the PCSB.

5

The MAC layer transmits a signal requesting the current transmission message to be spread with a unique long code to the PHY in step 405.

The PHY spreads the reverse common channel using an ESN mask, a private
10 long code mask, or a designated long code mask and transmits a response message or user traffic data on the designated reverse common channel in step 406. Here, the MS refers to a common power control channel in transmitting the message to the BS. The ID of the common power control channel can be detected from DAM_ADDRESS and the transmission rate of the reverse common channel is set according to
15 RATE_WORD in the message received from the BS. If the message received from the BS designates an action time, the MS transmits the response message or the user traffic data to the BS at the designated action time. On the other hand, if the system sets the action time of the CE to a particular value, the MS does not know the action time and thus transmits the message at an arbitrary time.

20

Therefore, a reverse common channel signal is spread with an MS unique long code or a particular spreading code designated by the BS prior to transmission. Consequently, the designated reverse common channel serves similarly as a dedicated channel.

25

[EFFECTS OF THE INVENTION]

As described above, in accordance with the present invention, for designation of a reverse common channel, a BS transmits a control message including long code information indicating a spreading code, channel transmission rate, and information
5 about a common power control channel to an MS. The MS spreads user data with a unique long code for the reverse common channel and transmits a response message for the control message on the designated reverse common channel. The designation of the reverse common channel to be dedicated ensures a rapid response time, increases a transmission success rate, and reduces interference between channels
10 caused by message retransmission. Furthermore, an MS LAC layer adds a lesser number of fields, resulting in the decrease of transmission errors.

[PATENT CLAIMS]

1. A method for designating a reverse common channel to be dedicated in a base station of a CDMA (Code Division Multiple Access) communication system,
5 the method comprising the steps of:

transmitting, through a forward common channel, dedication information for designating the reverse common channel generated from an LAC (Link Access Control) layer as a dedicated channel, so as to dedicate the reverse common channel for one-to-one communication between the base station and a particular mobile station,
10 and designating the reverse common channel as a dedicated common channel;

receiving through the designated reverse common channel a response message transmitted from the mobile station; and

after receiving the response message, releasing the designated reverse common channel.

15

2. The method as claimed in claim 1, wherein the dedication information includes a designated channel including indicator for representing whether the dedication information is included in a received message or not, a designated channel indicator for designating a spreading code used for designation of the common
20 channel, a DAM (Designated Access Mode) address representing the address of a power control channel, and a rate word for designating transmission rate.

3. The method as claimed in claim 2, wherein the designated channel indicator is one of an ESN (Electronic Serial Number) mask, a private long code mask
25 of a mobile station, and a scheduled R-CCCH (Reverse Common Control Channel) long code mask assigned to a specific MS by a BS for given time through scheduling.

4. The method as claimed in claim 2, wherein information about the designated channel indicator, the DAM address and the rate word is not transmitted when the designated channel including indicator is reset.

5

5. The method as claimed in claim 2, wherein the dedication information is included in a forward common channel message to which a mobile station must respond.

10

6. The method as claimed in claim 5, wherein the forward common channel message is one of messages shown in Table 11 below.

(Table 11)

Message Title on f-csch
Status Request Message
TMSI Assignment Message
General Page Message
SSD Update Message
Authentication Challenge Message
Base Station Challenge Confirmation Order
Extended Release Message
Service Redirection Message
Data Burst Message
Service Release Message
Order Message

15

7. The method as claimed in claim 2, wherein the dedication information

is included in user data.

8. The method as claimed in claim 2, wherein the dedication information further includes action time.

5

9. The method as claimed in claim 2, further comprising the step of further transmitting an access parameter including action time after transmission of the dedication information.

10 10. The method as claimed in claim 2, wherein the common channel is a reverse common control channel.

11. A method for designating a reverse common channel to be dedicated in a base station of a CDMA (Code Division Multiple Access) communication system,
15 the method comprising the steps of:

ordering, in a LAC (Link Access Control) layer, reservation of a channel element upon receipt of information ordering designation of the reverse common channel from a signaling layer;

upon reservation of the channel element, generating, in the LAC layer,
20 dedication information for designating the reverse common channel as a dedicated channel, and ordering the generated dedication information to be transmitted through a forward common channel; and

receiving a response message transmitted from a mobile station through the designated reverse common channel.

25

12. The method as claimed in claim 11, wherein the dedication

information includes a designated channel including indicator for representing whether the dedication information is included in a received message or not, a designated channel indicator for designating a spreading code used for designation of the common channel, a DAM (Designated Access Mode) address representing the address of a power control channel, and a rate word for designating transmission rate.

13. The method as claimed in claim 12, wherein the designated channel indicator is one of an ESN (Electronic Serial Number) mask and a scheduled reverse common channel long code mask assigned to a specific MS by a BS for given time through scheduling.

14. The method as claimed in claim 12, wherein the dedication information is included in a forward common channel message to which a mobile station must respond.

15

15. The method as claimed in claim 12, wherein the common channel is a reverse common control channel.

16. A method for designating a reverse common channel to be dedicated in a base station of a CDMA (Code Division Multiple Access) communication system, the method comprising the steps of:

releasing designation of a channel when a response message transmitted from a mobile station is received through the reverse common channel; and

releasing occupation of a channel element when the response message is not received through the designated reverse common channel within predetermined time.

17. A method for designating a reverse common channel to be dedicated in a mobile station of a CDMA (Code Division Multiple Access) communication system, the method comprising the steps of:

when a message is received through a forward common channel, recognizing,
5 in a LAC (Link Access Control) layer, dedication information for a common channel included in a received message; and

designating, in the LAC layer, the reverse common channel as a dedicated channel according to the dedication information and generating a response message responsive to the received message within predetermined action time to transmit the
10 response message through the designated reverse common channel.

18. The method as claimed in claim 17, wherein the dedication information includes a designated channel including indicator for representing whether the dedication information is included in a received message or not, a designated
15 channel indicator for designating a spreading code used for designation of the common channel, a DAM (Designated Access Mode) address representing the address of a power control channel, and a rate word for designating transmission rate.

19. The method as claimed in claim 18, wherein the designated channel
20 indicator is one of an ESN (Electronic Serial Number) mask and a scheduled reverse common channel long code mask assigned to a specific MS by a BS for given time through scheduling.

20. The method as claimed in claim 19, wherein the common channel is a
25 reverse common control channel.

[ABSTRACT OF THE DISCLOSURE]

[ABSTRACT]

A method of designating a channel to be dedicated between a base station and
5 a mobile station in a CDMA communication system is disclosed. The base station
generates designation information including a common channel designation indicator,
the address of a common power control channel, transmission rate, and action time and
transmits a message with the designation information to the mobile station. Then, the
mobile station receives the message with the designation information and transmits a
10 response message for the received message to the base station on a designated channel
indicated by the designated channel indicator with transmission power set by the
common power control channel at the data rate at the action time.

[REPRESENTATIVE FIGURE]

15 FIG. 1

[INDEX]

DESIGNATION, REVERSE COMMON CONTROL CHANNEL, COMMON
POWER CONTROL CHANNEL, DESIGNATION LONG CODE